
Sample Problems

The purpose of this sample problem is to familiarize you with the Worksheets and suggest a method for calculating Acceptable Separation Distances. While working out the ASDs for this sample problem you will find questions which may not apply to this situation but need to be considered in others. Also, some of the questions are not relevant directly to calculating the ASD but may be useful for obtaining information about the site.

Instructions

To determine the ASD, answers to several questions are needed.

1. What is the name of the hazardous substance? (give chemical name)
2. What is the physical state of the contained substance? (gas or liquid)
3. How many containers (tanks) are there?
4. What is the tank capacity (gallons) for each tank?
5. Which tank should you use for your ASD calculation?
6. Are the tanks diked or undiked?
7. Are the contents stored under pressure? (unpressurized or pressurized)
8. Are there any intervening structures or structural barriers between the tank (or tanks) and the proposed project site? (If yes, describe)
9. Are there any natural barriers between the tanks and project site? (If yes, describe)
10. Does the proposed project include outdoor spaces (e.g., playgrounds, open space, etc.) where people will congregate? (If yes, describe or diagram where located)
11. What is the distance (feet) between the tank(s) and project site building(s)? (Always measure from tank center)

Note: This list of questions is not all inclusive. There may be others you will need to ask to complete your hazards analysis under 24 CFR Part 51C.

Sample Problem Statement

An undiked 30,000 gallon (gal) pressurized liquid propane gas (LPG) tank is located 850 feet from a site for a proposed 250 unit multifamily housing project.

Question: Is 850 feet an acceptable separation distance for the housing development from the potential hazard?

Instructions: Use the Worksheets and the information you collect to calculate the ASDs for thermal radiation and blast overpressure for the sample problem.

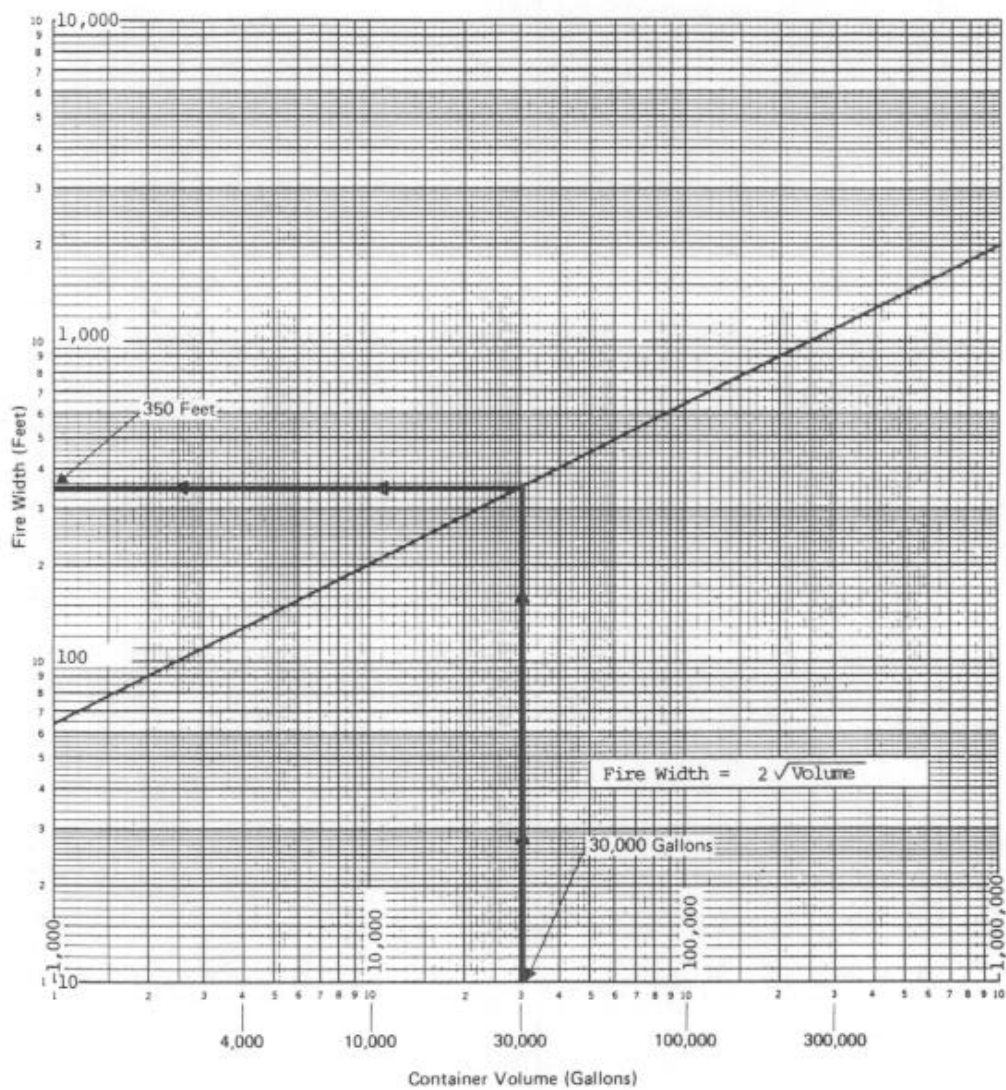
Thermal Radiation (Fire)

ASD calculations for fire involves two steps: Step 1. Obtain the fire width. Use Worksheet #1 to determine the fire width for an undiked tank (container). On the horizontal axis locate 30,000 gal. Draw a vertical

line from the 30,000 gal. point to the curve. Now, draw a horizontal line from the point of intersection with the curve to the left vertical axis and read fire width (feet).

The fire width is 350 feet.

Worksheet No. 1
Hazardous Liquid Container
Undiked/Fire Width

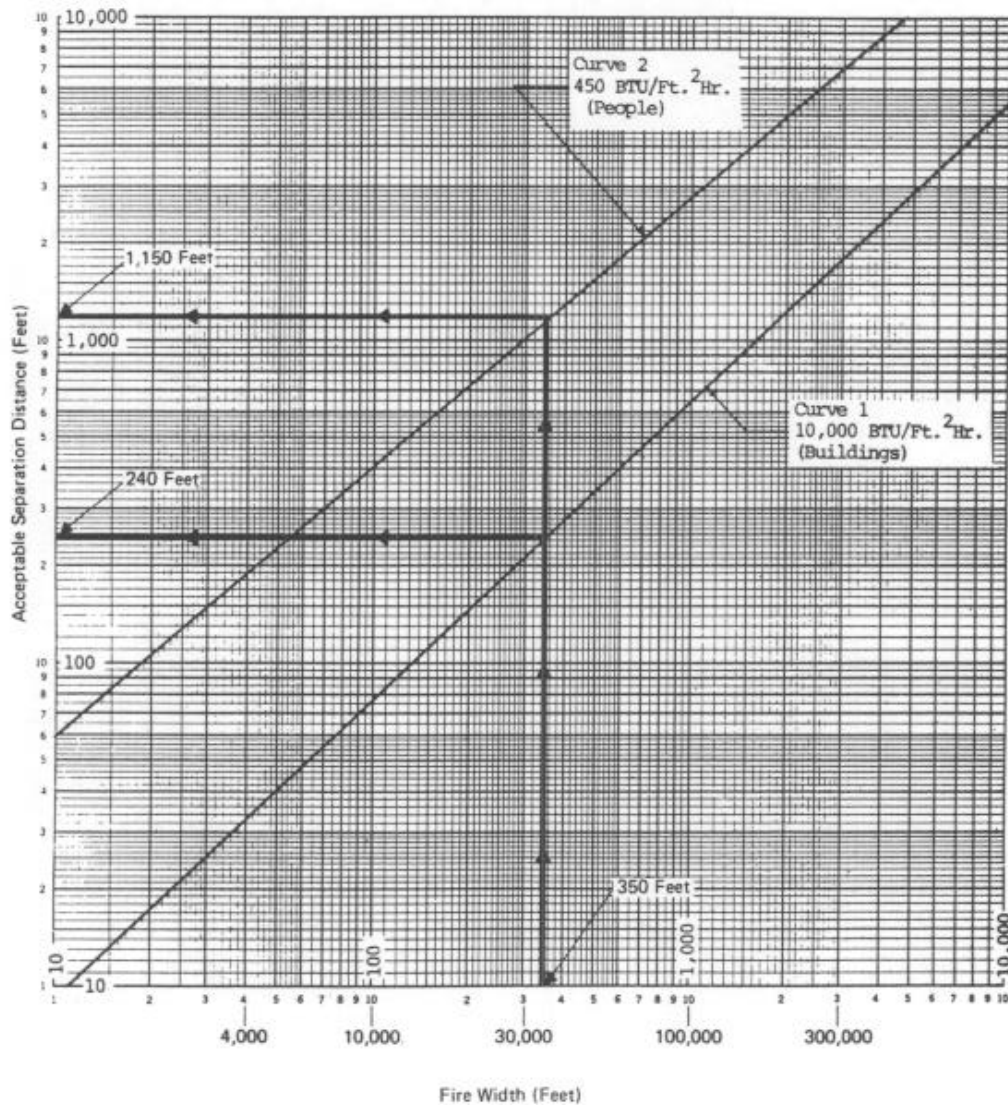


Step 2. To determine the ASD for thermal radiation use Worksheet #3. On the horizontal axis locate the fire width. (Fire width is 350 feet. Figure taken from Worksheet #1.) Draw a vertical line from the horizontal axis to intersect with both curves. Now draw two horizontal lines through the points of intersection of the vertical line with the curves to the vertical axis on the left and read ASD (feet). The ASDs for Buildings and People in unprotected areas are found on the vertical axis.

The ASD for Buildings is 240 feet.

The ASD for People in unprotected areas is 1,150 feet.

Worksheet No. 3
Acceptable Separation Distance
(Thermal Radiation)



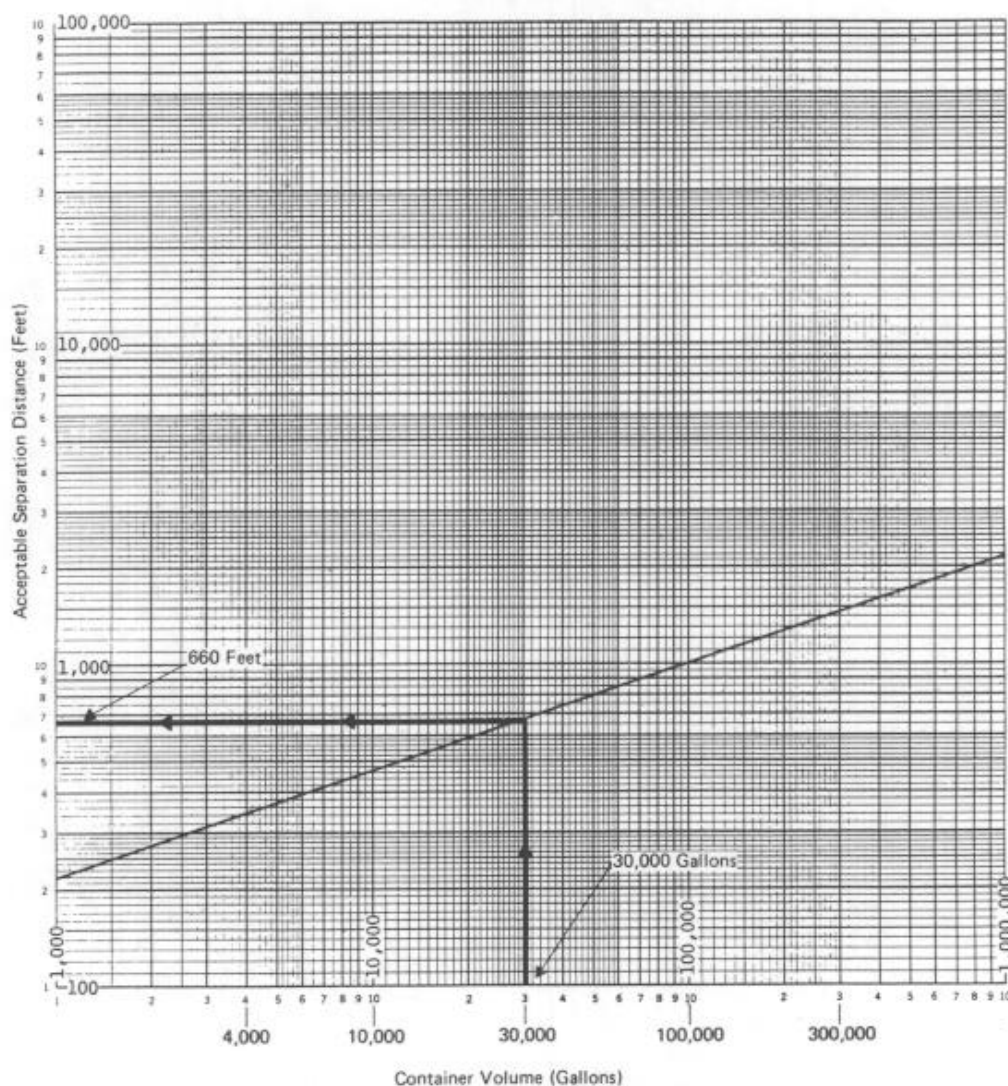
Note: For chemicals and petrochemicals stored under pressure ASD calculations must always be made for explosions.

Blast Overpressure (Explosion)

To determine the ASD for blasted overpressure use Worksheet #4. On the horizontal axis locate 30,000 gal. Draw a vertical line from the 30,000 gal. point to the curve. Now, draw a horizontal line from the point of intersection to the left vertical axis and read ASD (feet).

The ASD for blast overpressure is 660 feet.

Worksheet No. 4
Acceptable Separation Distance
(Blast Overpressure)



Findings: Since the actual distance of 850 feet is greater than both the ASD of 240 feet for fire for buildings and an ASD of 660 feet for explosion, the distance is *acceptable*. However, the distance is *unacceptable* for unprotected outdoor areas where people will congregate. Unprotected places of congregation such as yards, playgrounds, balconies and open space must be located 1,150 feet from the potential hazard unless mitigating measures are taken to shield the unprotected outdoor areas of congregation.